# Comments to the review " Nonthermal phenomena in clusters of galaxies" by Y.Rephaeli et al. that will appear on the book: Clusters of galaxies: beyond the thermal view.

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When the review on nonthermal phenomena in clusters of galaxies by Rephaeli, Nevalainen, Ohashi & Bykov 2008 (astro-ph/08010982; hereafter, RNOB08) appeared on the WEB we sent our comments to Prof. Y.Rephaeli. But the answer of the Editor, Dr J.Kaastra, of the book: "Clusters of galaxies: beyond the thermal view", was that he has checked with Springer, but unfortunately their process is already too far to make any changes to the paper. For this reason we have decided to put on the WEB these comments.

The comments regard: **a)** the boring controversial between the analysis of the PDS/*BeppoSAX* data of the Coma cluster with the software package XAS by Fusco-Femiano *et al.* 2004 (hereafter, FF04) and the Rossetti & Molendi analysis with a different software SAXDAS (hereafter, RM04); **b)** the a hard excess in A2199, A2163 and the Bullet cluster.

**Coma cluster:** In 2007 Fusco-Femiano, Landi & Orlandini (hereafter, FF07) have re-analyzed the PDS data using the same software of RM04 showing that it is possible to obtain the same results of FF04 explaining of course the reasons of the discrepancy between FF04 and RM04. Rossetti & Molendi replied to our paper (FF07) with an electronic preprint only (RM07) and we were obliged to a new reply (FF07R).

Unfortunately, the authors of the review have not read with the due attention the papers FF04, FF07 and FF07R (the last is not reported in the review) and this is a serious mistake for people that intend to write a review. So, we are obliged to repeat here briefly some of the things that are contained in the above papers.

In FF07 and in the reply FF07R we have reported that to explain the discrepancy between FF04 and RM04 a rigorous selection of the events is necessary in order to eliminate the presence of any spikes able to introduce noise that hides the presence of a nonthermal excess with respect to the thermal radiation. We have a significant increase of the c.l. of the excess

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(from $\sim 2.9\sigma$ to $\sim 4.2\sigma$) when we consider in the SAXDAS analysis (FF07) the same time windows used in the XAS analysis (FF04). The authors of the review report instead that the discrepancy is **only** due to the different determination of the background between FF04 and RM04. In FF04 we consider only the -OFF direction for the presence of a contaminating BL Lac object in the +OFF direction. Besides, the authors of the review omit to report that in FF04 and FF07R we have shown that also considering the standard technique that implies an average of the two backgrounds determinations, the c.l. of the excess is still at $3.9\sigma$.

The authors of the review report that a point raised by RM07 to defend their re-analysis and the lower detection significance of the hard excess was also the choice in FF04 of the value of the temperature ($8.11 \pm 0.07$ keV measured by *Ginga* , David *et al.* 1993). Following RM04 and RM07 a more appropriate value is $8.21 \pm 0.16$ keV. RBNO08 omit to report in their review that in FF07R we have computed, to satisfy Rossetti & Molendi, the excess assuming a gas temperature of 8.4 keV, the upper limit of the reported interval in RM04 and RM07. We obtain a c.l. for the excess of $4.15\sigma$. Moreover, the *Ginga* value has been confirmed by *RXTE* that reports $7.90 \pm 0.03$ keV (Rephaeli & Gruber 2002) and in the fit of Fig. 1 of the review the *RXTE* data give 7.67 keV (!!).

The authors of the review report that we have never clarified the point regarding the possible presence of systematic errors raised by RM04 and RM07. In FF07 and in FF07R we have stressed that the systematic errors are discussed in detail by Fusco-Femiano, Landi & Orlandini 2005 (FF05) for the analysis of the excess in A2256. Our surprise for this statement present in the review is that the referee of FF05 was Dr J.Nevalainen, one of the authors of the review. In particular, the referee was in agreement with our analysis on the *whole* sample of PDS pointings (869, while RM04 consider only 69 observations) regarding the possible systematic difference between the OFF fields reported in RM04 and RM07. Our analysis gives a value of $(5.3 \pm 6.3) \times 10^{-3}$, consistent with no contamination at all. Besides, the same sample was used to measure the X-ray background (Frontera *et al.* 2007) and the results are absolutely consistent with the Integral results with a PDS flux that is lower of $\sim 10\%$ of the Integral flux. This a further confirmation of the correctness of the PDS results.

**A2199:**for this cluster the authors of the review probably ignore that Fusco-Femiano *et al.* (2003) have re-analyzed the MECS data showing that the nonthermal excess reported by Kaastra *et al.* (1999) is not present. The discrepancy is probably due to the use of a more evolved software package by Sabrina De Grandi.

**A2163:**the authors of the review do not report in Sect. 3.4 "Search for NT emission with *BeppoSAX* " that the PDS observation gives only an upper limit to the nonthermal flux as reported by Feretti *et al.* (2001).

**A2163 & Bullet cluster:** Finally, we have expressed to the authors of the review our invite to avoid to present the excess in these two clusters reported by *RXTE* observations as firm detections considering the large error bars in the spectra.

Even if the book editor, Dr. J.Kaastra, affirms that the publishing process is already too far, we would have same doubt to publish a review that contains uncorrect statements.

We think that, for the sake of intellectual honesty, at least an addendum page should be included in the book taking into account our comments, in order to allow the reader to have a more complete grasp on one of the book main topics: non-thermal phenomena in clusters of galaxies.

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